

Amendments to the Specification:

Please replace the paragraph that begins on page 2, line 3 with the following amended paragraph:

As is well known, header data may be used at a node to manage the transmission network. In principle, a network operator can choose to use any of the bytes from the header in the nodes of the network to manage the network in any particular manner. In practice, however, a network operator may not be able to do this because of the way in which payload data is transported through the network, e.g., if the payload data is transported from a first sub-network of a first operator to a second sub-network of that first operator via a third sub-network of a second operator. Because there need not be a one-to-one correspondence between headers coming out of the last node of the first sub-network (before entering the third sub-network) and headers entering the second sub-network (from the ~~second~~ third sub-network), the third sub-network is not transparent to the first operator. Information that is relevant to the first network operator may be lost when the nodes of the third sub-network generate headers as desired by the second operator. The extent to which there is freedom to copy header data from one header to another is often severely limited. For example, consider the situation where a first and second SDH sub-network that carry frames comprising STM-16 signals are connected via an SDH sub-network that carries frames with STM-64 or STM-256 signals. An STM-16 signal has 1152 header bytes, but only about 25 of these bytes are forwarded in the STM-64 or STM-256 signal.

Please replace the paragraph that begins on page 2, line 32 with the following amended paragraph:

Timing and synchronization problems associated with transporting information between sub-networks via an intermediate sub-network are solved according to the principles of the invention by transporting header information in the payload section of frames across boundaries between the sub-networks and the intermediate sub-network. Accordingly, the header information from the sub-networks passes through the intermediate sub-network without being changed. Because the header information is carried in the payload section, header information is not lost because of asynchronous operation between the networks. Moreover, the third sub-network is effectively transparent to the first and second sub-networks and without requiring larger bandwidth in the third sub-network. For example, information is retained from the header data of the first and second sub-networks upon transport through the third sub-network. Extra bandwidth is not required in the intermediate sub-network because frames transmitted in the intermediate sub-network have reduced-size headers and expanded payload sections.

Please replace the paragraph that begins on page 3, line 35 with the following amended paragraph:

According to another aspect of the invention, timing information is added to a payload section when crossing a first boundary between the first and third sub-networks. The timing information indicates the extent to which the frame duration (the length of the time interval taken up by a frame) in the first sub-network differs from the frame duration in the third sub-network. Upon crossing a second boundary between the third and second sub-networks, this timing information is then used to regenerate frames in the second sub-network that have substantially the same duration as the frames in the first sub-network. Thus, transport through the third sub-network also becomes transparent with respect to timing.

Please replace the paragraph that begins on page 4, line 31 with the following amended paragraph:

As shown, first sub-network 10 includes interface unit 11 for transporting information across the boundary between first sub-network 10 and third sub-network 14. Interface unit 11 has inputs 110a-d for receiving frames, each comprising a header and payload information, from inside first sub-network 10. Interface unit 11 comprises header reduction units 112a-d, rate adaptation units 114a-d, interleaver 116, and header insertion unit 118. Each of inputs 110a-d is coupled to interleaver 116 via a cascade of a respective one of header reduction units 112a-d and a respective one of rate adaptation units 114a-d. Interleaver 116 is coupled to an input of third sub-network 14 via header insertion unit 118.

Please replace the paragraph that begins on page 5, line 32 with the following amended paragraph:

First row 24 of the STM-16 signal contains, within header portion 20, forty-eight (48) A1 bytes, followed by forty-eight (48) A2 bytes, followed by a J0 byte, fifteen (15) Z0 bytes and thirty-two (32) national use (NU) bytes. According to well-known SDH/SONET transmission standards, the contents of the A1 and A2 bytes serve to provide a unique pattern of bytes that can be used to align to the start of a frame. The J0 byte contains a trace identification for identifying the source of the signal transported in the frame. The Z0 bytes are as yet undefined bytes reserved for future international standardization. The national use (NU) bytes allow transport of certain country specific information.

Please replace the paragraph that begins on page 6, line 28 with the following amended paragraph:

In outgoing frames, slightly more space is reserved per frame than is nominally necessary to transport the reduced data for a frame received from header reduction units 112a-d. When one or more of the bit rates (f_1 - f_4) are higher than the common bit rate (f_0), rate adaptation units 114a-d include excess information in the reserved space. In this case, information amounting to slightly more than one incoming frame is transported on average per outgoing frame. Rate adaptation unit 114a-d adds information to the outgoing frame indicating that, and the extent to which, this has happened. Thus, the position of the starting point of incoming frames "floats" in the outgoing frame.

Please replace the paragraph that begins on page 8, line 34 with the following amended paragraph:

Finally, header extension units 133a-d read the header information from the information received from third sub-network 14 and restore the original headers, supplementing any information removed by header reduction units 112a-d. Restored frame signals, containing header data, payload and timing substantially as received at inputs 110a-d is then transmitted into second sub-network 12. Thus, the first and second sub-networks 10 and 12 can be managed as a single network, even though signals have passed through third sub-network 14.